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Attorney's Docket No. 67,200-530

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Chung-En Kao

Serial No.: 09/976,082

Filed: Oct. 12, 2001

For: Apparatus and Method for Self-Centering a Wafer in a Sputter Chamber

Group Art Unit: 1753

Examiner: Steven H. Versteeg

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF (PATENT APPLICATION-37 CFR 192)

1. Transmitted herewith, in triplicate, is the APPEAL BRIEF in this application, with respect to the Notice of Appeal Filed on July 7, 2003.

NOTE: "The Appellant shall, within 2 months from the date of the notice of appeal under §1.191(a) or within the time allowed for response to the action appealed from, if such time is later, file a brief in "triplicate", 37 C.F.R. 1.192(a) [emphasis added].

2. STATUS OF APPLICANT

This application is on behalf of:

X other than a small entity.
___ a small entity.

A verified statement:

___ is attached.
___ was already filed.

3. FEE FOR FILING APPEAL BRIEF

Pursuant to 37 CFR 1.17(f), the fee for filing the Appeal Brief is:

___ small entity \$160.00
X other than a small entity \$320.00

Appeal Brief fee due: \$ 320.00

Certificate of Mailing/Transmission (37 CFR 1.8(a))

I hereby certify that this correspondence is, on the date shown below, being:

Mailing

X deposited with the U.S. Postal Service
with sufficient postage as Express Mail
Label No. EV 282 673 275 US
in an envelope addressed to Box Appeal,
Assistant Commissioner for Patents,
Washington, D.C. 20231

Dated: 9-8-03

Kathy Dixon

4. EXTENSION OF TERM

NOTE: The time periods set forth in 37 CFR 1.192(a) are subject to the provision of ☐ 1.136 for patent applications. 37 CFR 1.191(d). See also Notice of November 5, 1985 (1060 O.G. 27).

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136 apply:

(complete (a) or (b), as applicable)

- (a) ☐ Applicant petitions for an extension of time under 37 CFR 1.136
(fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

	Extension (months)	Fee for other than small entity	Fee for small entity
<input type="checkbox"/>	one month	\$ 110.00	\$ 55.00
<input type="checkbox"/>	two months	\$ 390.00	\$195.00
<input type="checkbox"/>	three months	\$ 930.00	\$465.00
<input type="checkbox"/>	four months	\$1,470.00	\$735.00

Fee: \$ _____

If an additional extension of time is required, please consider this a petition therefor.

(check and complete the next item, if applicable)

- ☐ An extension for _____ months has already been secured, and the fee paid therefor of \$ _____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request: \$ _____

or

- (b) ☐ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

5. TOTAL FEE DUE

The total fee due is:

Appeal Brief Fee: \$ 320.00
Extension fee (if any) \$ _____

TOTAL FEE DUE: \$ 320.00

6. FEE PAYMENT

X Attached is a Credit Card Payment Form for the sum of \$ 320.00
X Charge Visa Credit Card No. 4756 8461 9568 0263 the sum of \$ 320.00.
A duplicate copy of this transmittal is attached.

7. FEE DEFICIENCY

NOTE: If there is a fee deficiency and there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum six-month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays are encountered in returning the papers to the PTO Finance Branch in order to apply these charges prior to action on the cases. Authorization to charge the deposit account for any fee deficiency should be checked. See the Notice of April 7, 1986, 1065 O.G. 31-33.

 X If any additional extension and/or fee is required, this is a request therefor
to charge Visa Credit Card No. 4756 8461 9568 0263

And/Or

 X If any additional fee for claims is required, please charge Visa Credit Card
No. 4756 8461 9568 0263



Signature of Attorney

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant: Chung-En Kao

Group Art Unit: 1753

Serial No.: 09/976,082

Examiner: Steven H. Versteeg

Filed: Oct. 12, 2001

For: Apparatus and Method for Self-Centering a Wafer
in a Sputter Chamber

Attorney Docket No.: 67,200-530

8/WM.
9/17/03

EXPRESS MAIL CERTIFICATE

"Express Mail" label number EV 282 673 275US
Date of Deposit Sept. 8, 2003

I hereby certify that this paper in triplicate and a credit card payment form in the amount of \$320.00 (required filing fee) are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR \$1.10 on the date indicated above and is addressed to: Mail Stop: Appeal, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

Kathy Dixon

APPEAL BRIEF

Mail Stop: Appeal
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant appeals in the captioned application from the Examiner's final rejection dated April 7, 2003, of claims 1, 3-5 and 7-14, under 35 USC §103(a) as being unpatentable over Banholzer et al '198 in view of Lamont Jr. '556.

It is urged that the rejection be reversed and that all the claims be allowed.

(1) REAL PARTY IN INTEREST

The real party in interest in the present appeal is the recorded Assignee of Taiwan Semiconductor Manufacturing Company, Ltd.

(2) RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that are known to the Appellant, the Appellant's legal representative, or the assignee.

(3) STATUS OF CLAIMS

Claims 1, 3-5 and 7-14 are pending in the application.

Claims 1, 3-5 and 7-14 stand rejected.

(4) STATUS OF AMENDMENTS

A Request For Reconsideration was filed on or about June 9, 2003.

An Advisory Action was received from the Examiner dated July 15, 2003, maintaining the rejection of all claims.

A Notice of Appeal was filed on or about July 7, 2003.

(5) SUMMARY OF THE INVENTION

The invention relates to an apparatus and a method for self-centering a wafer onto a wafer pedestal situated in a physical vapor deposition chamber.

(Specification, paragraph 001)

In a preferred embodiment, a wafer lifter for self-centering a wafer on a pedestal may be provided which includes a lifter body of annular shape that has a center cavity with a diameter that is larger than a diameter of the wafer pedestal; at least four support fingers emanating upwardly from the lifter body and are spaced-apart from each other; and a platform on a tip portion of each of the at least four support fingers defined by a surface slanted from a vertical plane of an outside surface of the support finger; the platform, when supporting a wafer thereon, leaves substantially no gap between the slanted surface and an outer periphery of the wafer.

(Specification, paragraph 016)

The present invention is further directed to a method for self-centering a wafer on a wafer pedestal which can be carried out by the operating steps of first providing a wafer lifter that includes a lifter body of annular shape that has a center cavity with a diameter that is larger than a diameter of the wafer

pedestal, at least four support fingers emanating upwardly from the lifter body and are spaced-apart from each other, and a platform on a tip portion of each of the at least four support fingers defined by a slanted surface from a vertical plane of an outside surface of the support finger, the platform when supporting a wafer thereon leaves no gap between the slanted surface and an outer periphery of the wafer; positioning a wafer on the wafer lifter supported by the platform on the tip portion of the at least four support fingers; and lifting the wafer lifter to a position over the wafer pedestal and depositing the wafer onto the pedestal.

(Specification, paragraph 018)

(6) **ISSUE**

Is the rejection of claims 1, 4-5 and 7-14 under 35 USC §103(a) as being unpatentable over Banholzer et al '198 and Lamont Jr. '556 proper when such references do not teach or suggest the specifically claimed limitations in the present application?

(7) **GROUPING OF CLAIMS**

The rejection of claims 1, 4-5 and 7-14 are contested as a group.

The rejection of claim 3 is rejected as a separate group.

(8) ARGUMENTS

Claim 3 is rejected under 35 USC §112, second paragraph, in the final Office Action dated April 7, 2003, for being dependent upon claim 2. In the Request for Reconsideration, the Appellant amended the dependency of claim 3 to claim 1. However, in the Advisory Action, the Examiner maintained the rejection of claim 3 as containing an antecedent basis problem. The Appellant will prepare a supplemental amendment to change "said slanted shoulder portion" to "a slanted shoulder portion", if such amendment is allowed. There is no art rejection on claim 3.

Claims 1, 4-5 and 7-14 are rejected under 35 USC §103(a) as being unpatentable over Banholzer et al '198 in view of Lamont, Jr. '556. It is contended that Banholzer et al disclose a method for placing a substrate on the pedestal which has a wafer support ring and wafer lifters including a lifter body of annular shape that has a center cavity with a diameter larger than the diameter of the wafer pedestal; four support fingers; and platform defined by slanted surfaces from a vertical plane. It is further contended that while Banholzer et al does not disclose the material of the lift member or the material sputter deposited, such are disclosed by Lamont, Jr. in a method for **preventing contamination of a wafer**

during sputtering, that all components within the sputter chamber should be coated with the material to be deposited.

The rejection of claims 1, 4, 5 and 7-14 under 35 USC §103(a) based on Banholzer et al and Lamont, Jr. is improper and must be reversed.

The Appellant respectfully submits that Banholzer et al and Lamont, Jr., either singularly or in combination thereof, does not teach a lift body that is fabricated of a material which has a rigidity of at least that of aluminum, or the step of fabricating a lift body for a wafer lifter with aluminum or stainless steel. Regarding the Examiner's contention that "Lamont, Jr. discloses ... all components within the sputter chamber should be coated with the material to be deposited" and further "to modify the invention of Banholzer to use aluminum as the material for the lift body because of the desire to prevent contamination when sputtering aluminum", the Appellant respectfully submits that such are not the present invention, i.e. the present invention does not aim at preventing contamination. Instead, the present invention teaches that the lift body must be fabricated of a material of sufficient rigidity, i.e. at least that of aluminum, or fabricated of aluminum or stainless steel, such that the lift body can sustain the high

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process temperature of the sputter chamber. Such criticality is clearly presented in the specification on page 14, lines 7-11:

"The design is such that when the wafer lifter is used in a fabrication process, the high temperature of the sputter chamber expands the wafer lifter and thus a small gap, such as 0.5 mm, between the wafer and the slanted shoulder portion is provided."

In the Response to Argument section of the 04/07/2003 Office Action, the Examiner argued that:

"Applicant has argued that Lamont, Jr. aims at preventing contamination whereas Applicant has a different purpose. That appears to be the only argument. Applicant's has not claimed a different purpose. there is motivation to combine the references. In essence, Applicant has argued that because there is a different reason for combining the references than Applicant's invention, the invention is not obvious. On that argument, the Examiner must disagree."

The Appellant respectfully submits that the Applicant has not argued that because there is a different reason for combining the references than Appellant's invention, the invention is not obvious. Instead, the arguments of the Appellant is such that **even when the Banholzer et al and Lamont, Jr. references are combined, the requirement of fabricating a lift body of a material that has a rigidity of at least that of aluminum is neither taught or disclosed by the references.**

The rejection of claims 1, 4, 5 and 7-14 under 35 USC §103(a) based on Banholzer et al and Lamont, Jr. is improper and must be reversed.

CLOSING

In summary, the Appellant has shown that his claimed invention is fully supported by a body of evidence of non-obviousness. It is therefore respectfully submitted that such evidence of non-obviousness overcomes any showing of obviousness presented by the Examiner. The Appellant therefore submits that the final rejection of his claims 1, 3-5 and 7-14 is improper under 35 USC §103(a).

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The reversal of the final rejection is respectfully
solicited from the Board.

Respectfully submitted,

Tung & Associates

By: 

Randy W. Tung

Registration No. 31,311

Telephone: (248) 540-4040

RWT\kd

CLAIM APPENDIX

1. A wafer lifter for self-centering a wafer on a pedestal comprising:

a lifter body of annular shape having a center cavity with a diameter that is larger than a diameter of the wafer pedestal, said lifter body is fabricated of a material that has a rigidity of at least that of aluminum;

at least four support fingers emanating upwardly from said lifter body and are spaced-apart from each other; and

a platform on a tip portion of each of said at least four support fingers defined by a slanted surface from a vertical plane of an outside surface of said support finger, said platform when supporting a wafer thereon leaves substantially no gap between said slanted surface and an outer periphery of the wafer.

3. A wafer lifter for self-centering a wafer on a pedestal according to claim 1, wherein a base of said slanted shoulder portion of the support finger defines a diameter of a circular area surrounded by the platforms of the at least four support fingers which is not larger than a diameter of said wafer when measured at 23°C.

4. A wafer lifter for self-centering a wafer on a pedestal according to claim 1, wherein said at least four support fingers are substantially equally spaced-apart from each other.

5. A wafer lifter for self-centering a wafer on a pedestal according to claim 1, wherein said platform when supporting a wafer thereon leaves a gap smaller than 0.5 mm between said slanted surface and said outer periphery of the wafer.

7. A wafer lifter for self-centering a wafer on a pedestal according to claim 1, wherein said lifter is equipped with four support fingers emanating upwardly from said body.

8. A wafer lifter for self-centering a wafer on a pedestal according to claim 1, wherein said lifter body is equipped with four support fingers emanating upwardly from said body at a 90° angle from a horizontal plane of said body.

9. A wafer lifter for self-centering a wafer on a pedestal according to claim 1, wherein said lifter body has a ring shape.

10. A method for self-centering a wafer on a wafer pedestal comprising the steps of:

fabricating a lifter body for a wafer lifter with aluminum or stainless steel, said lifter body having an annular shape and a center cavity with a diameter that is larger than a diameter of said wafer pedestal, said wafer lifter further having at least four support fingers emanating upwardly from said lifter body and are spaced-apart from each other, and a platform on a tip portion of each of said at least four support fingers defined by a slanted surface from a vertical plane of an outside surface of said support finger, said platform when supporting a wafer thereon leaves substantially no gap between said slanted surface and an outer periphery of the wafer;

positioning a wafer on said wafer lifter supported by said platform on said tip portion of the at least four support fingers; and

lifting said wafer lifter to a position over said wafer pedestal and depositing said wafer onto said pedestal.

11. A method for self-centering a wafer on a wafer pedestal according to claim 10 further comprising the step, after said lifting step, of lowering said wafer lifter to deposit said wafer onto said wafer pedestal.

12. A method for self-centering a wafer on a wafer pedestal according to claim 10 further comprising the step of sputter depositing a metal layer on a top surface of said wafer.

13. A method for self-centering a wafer on a wafer pedestal according to claim 10 further comprising the step of self-centering the wafer on said wafer lifter during said positioning when said wafer is guided into a center position by said slanted surface on said tip portion of the at least four support fingers.

14. A method for self-centering a wafer on a wafer pedestal according to claim 10 further comprising the step of providing four support fingers that are vertically mounted on said lifter body.